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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/737,334

12/16/2003

Richard A. Craig

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EXAMINER

PALABRICA, RICARDO J

ART UNIT

PAPER NUMBER

3663

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

04/06/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/737,334

Applicant(s)

CRAIG ET AL.

Examiner

Rick Palabrica

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 16-46, 52 and 53 is/are pending in the application.
- 4a) Of the above claim(s) 21, 23, 24, 35 and 38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-20, 22, 25-34, 36, 37, 39-46, 52 and 53 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. Applicant's 3/16/07 Amendment, which directly amended claims 16-19, 25, 29, 42, added new claims 52 and 53, and traversed the rejection of claims in the 9/18/06 Office action, is acknowledged.
2. Applicant argues that the amended claims define over applied art, Gomberg (U.S. 5,440,136). The examiner agrees. However, the claims still do not define over other applied art, as discussed below.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 16, 52 and 53 are rejected under 35 U.S.C. 102(b) as being anticipated by either one of Nishimura et al. (U.S. 5,327,773) or Gomberg (U.S. 4,918,315).

Nishimura et al. disclose a method of measuring steam density by neutron scattering. Their method comprises directing a stream of fast neutrons from source 21 and detecting the thermalized neutrons backscattered from the hydrogen-containing steam after a time delay when the fast neutrons are emitted from source 21 (see col. 6, lines 14+).

As to the step of communicating the detection of the thermalized neutrons to the user, this is inherent in Nishimura et al. because the detection signals from these neutrons contain the information that a user expects from applying their method.

As to the step of “detecting a time when said stream of fast neutrons is emitted from said neutron source”, again this is inherent in Nishimura et al. because such time is manifested by the detection signals from neutron detectors 22 and 23, which are adjacent to neutron source 21. These detectors inherently detect the emission of fast neutrons when they are emitted from source 21. The detection signals may be weak because of the detectors’ low sensitivity to fast neutrons but such signals cannot be prevented.

Gomberg discloses a neutron scatter method for noninvasive interrogation of objects, e.g. explosives (see col. 1, lines 33+). His method comprises directing a stream of fast neutrons 16 from source 12, and detecting the thermalized neutrons backscattered from the object after a time delay when the fast neutrons are emitted from source 12 (see col. 12, lines 3+).

As to the step of “detecting a time when said stream of fast neutrons is emitted from said neutron source”, Gomberg discloses that the operation of his neutron detectors 20 is synchronized with neutron bursts so that these detectors only sense neutrons produced by the bursts and scattered from the container (see col. 13, lines 30+ and col. 12, lines 9+).

As to the step of communicating the detection of the thermalized neutrons to the user, see Fig. 1 and display element 38.

As to the detection of hydrogen, see col. 9, lines 57+ or col. 20, lines 63+.

4. Claims 17-20, 22, 25-34, 42, and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Gomberg.

As to claims 17, 26 and 30, the measurement after a time delay and a window, and disablement after the window, these are inherently performed as part of the time of flight measurement. See, for example, col. 8, lines 13+

As to claims 20 and 22, see col. 10, lines 41+, and Fig. 5.

As to claims 18, 19, 27, 31 and 32, absent applicant's definition of "upper level discriminator setting," Gomberg's method reads on the measurement setting that excludes signals with energies or amplitudes higher than the signals from hydrogenous elements detected by the method.

As to claims 28, 33 and 34, Gomberg's neutron source has a collimator 16 to focus the neutron beam at the target, which collimator provides spatial resolution of the neutron signal (see Fig. 2 and col. 11, lines 42+).

As to claim 42, see Fig. 5.

As to claim 43, applicant's claim language, "user interface" reads on display 38.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 36 and 37 are rejected under U.S.C. 103(a) as being unpatentable over Gomberg in view of Bartko (U.S. 3,832,545). Gomberg discloses the applicant's claim limitations except for the specific neutron source.

Bartko teach a method of detecting explosives using a Cf-252 as a source of fast neutrons because its size provides a high degree of utility and adaptability in the design of specific apparatus (see col. 2, lines 6+).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method, as disclosed by Gomberg, by the teaching of Bartko, to use Cf-252 as the fast neutron source, to gain the advantages thereof (i.e., good adaptability to apparatus), because such modification is no more than the use of a well known neutron source within the nuclear art.

6. Claims 39 and 40 are rejected under U.S.C. 103(a) as being unpatentable over Gomberg, in view of Kuan-Han Sun et al. (U.S. 2,994,769). Gomberg discloses the applicant's claim limitations except for the specifics on the neutron sensor.

Gomberg has been discussed above. He does not specify any particular type of neutron sensor. He teaches that his neutron detectors may comprise scintillation type detectors as are well known to those having skill in the art (see col. 11, lines 58+). This statement implies that conventional scintillation detectors of neutrons can be used in his invention.

Kuan-Han Sun et al. teach a Li-6 scintillator that is advantageous for detecting thermal neutrons because of its insensitivity to gamma and background radiation (e.g., see col. 2, lines 32+ and paragraph bridging cols. 2 and 3).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method, as disclosed by Gomberg, by the teaching of Kuan-Han Sun et al., to use a Li-6 scintillator as a thermal neutron sensor, to gain the advantages thereof (i.e., good discrimination of background radiation), because such modification is no more than the use of a well known expedient for detecting thermal neutrons within the nuclear art.

7. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gomberg, in view of either Hahn (U.S. 3,577,158) or Buchanan (U.S. 5,083,029).

Gomberg has been discussed above. He teaches that his neutron detectors may include neutron shields to prevent spurious readings (see sentence bridging cols. 11 and 12). He does not specify any particular type of neutron shield which implies that any conventional neutron shield may be used for his invention.

Either one of Hahn or Buchanan teach a neutron shield comprising boron.

One having ordinary skill in the art would have recognized that all references are in the same field of endeavor and the teachings of Hahn or Buchanan would apply to the others. Note that the element boron disclosed in Hahn or Buchanan will inherently contain some  $^{10}\text{B}$  isotope because this isotope is found in natural boron.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by Gomberg '136, by the teachings of either one of Hahn or Buchanan, to include a neutron shield comprising a material containing  $^{10}\text{B}$ , to reduce spurious readings, because such modification is no more than the use of conventional designs/techniques within the nuclear art.

8. Claims 44-46 are rejected under 35 U.S.C. 103(b) as being unpatentable over Gomberg.

As to the limitation in the claims regarding the value of the time delay, this is a matter of optimization within prior art conditions or through routine experimentation (see MPEP 2144.05 II.A). This time delay depends on a plurality of parameters, including the energy of neutrons emitted by the source, the detector/target configuration, the nature of the target, etc., and the combination of these parameters have to be selected for optimum operation.

### ***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



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10. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 571-272-6880. The examiner can normally be reached on 6:00-4:30, Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RJP

March 26, 2007



**RICARDO J. PALABRICA**  
**PRIMARY EXAMINER**